

ABSTRACT

Cultured muscle tissue used as actuators in microelectromechanical systems (MEMS) for mechanical and electrical power generation can either be dissected or cultured from myoblasts and grown *in situ*. The MEMS is fabricated using conventional techniques (surface or bulk micromachining) and incorporating surface modification techniques and/or anchor structures to favor muscle attachment followed by post-processing to assemble dissected muscle tissue or grow the self-assembling muscle tissue at the desired sites. Initial post processing is done to incorporate PZT devices for energy conversion. Additional post-processing is then done for muscle tissue self-assembling; that includes coating the MEMS with polymers that will either repel or favor the muscle growth, and the culturing on the muscle tissue starting from myoblasts. The system is fueled by adding glucose to the medium in which it is contained.